

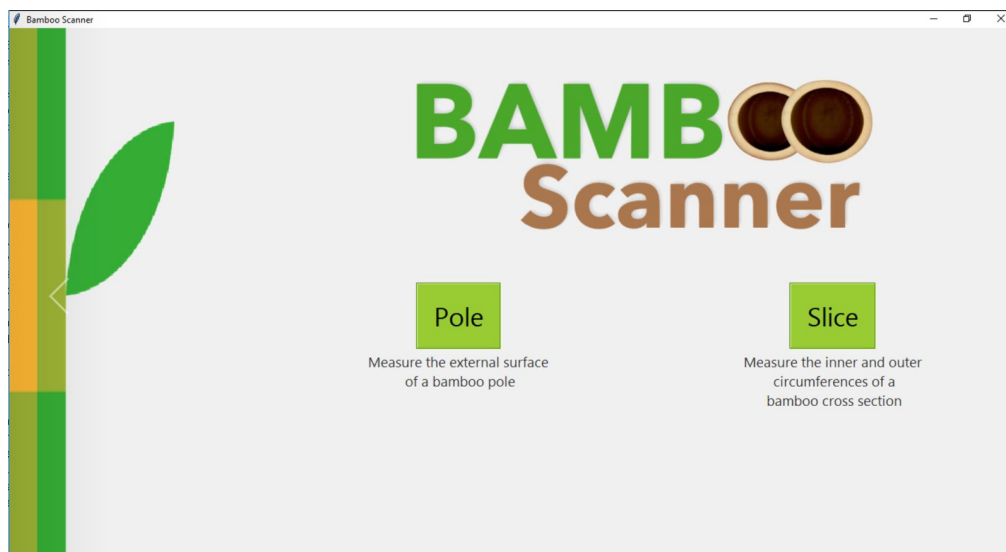
# BAMBOO Scanner

## Guide

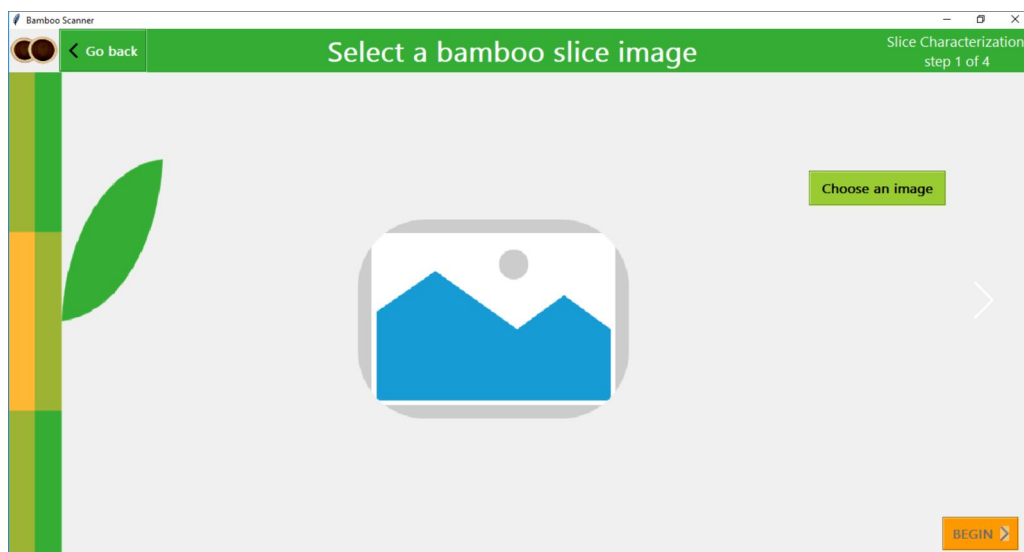
Bamboo Scanner is design to characterize bamboo material in two different fashions: Bamboo Slice Characterization (BSC) and Bamboo Pole Characterization (BPC). BSC allows to analyze the image of a bamboo slice and determine its outer and inner radii, identifying points along the circumferences and outputting polar coordinates along them. BPC allows to analyze a bamboo pole from the exterior with an array of twelve (12) infrared distance sensors and a ultrasonic sensor mounted in a ring structure that runs on a rail along the pole.

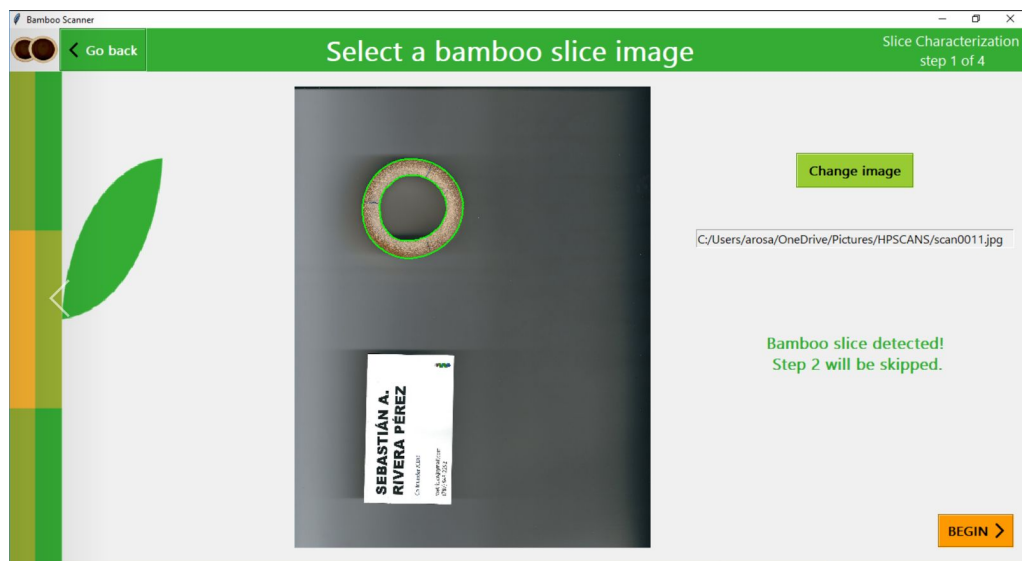
### Bamboo Slice Characterization:

- Select BSC option from homescreen.

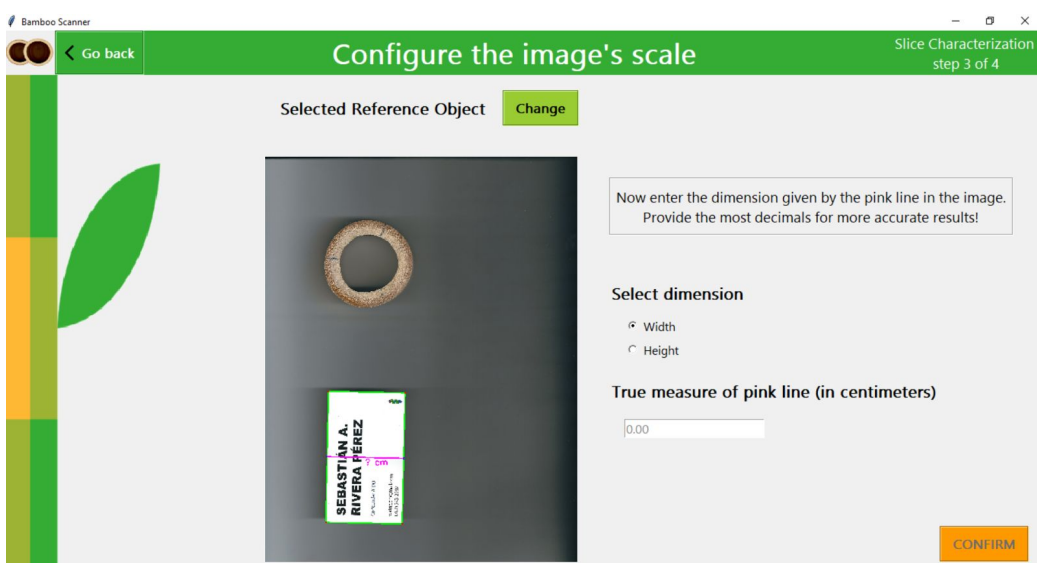
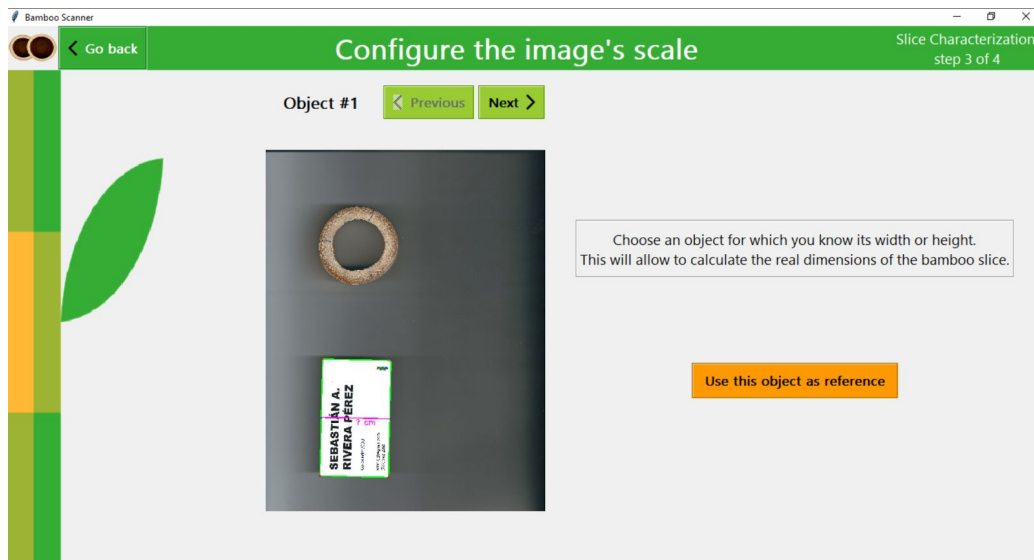


- Choose image to be analyzed. The image must contain at least two identifiable circumferences and possibly extra reference objects. Select Next.

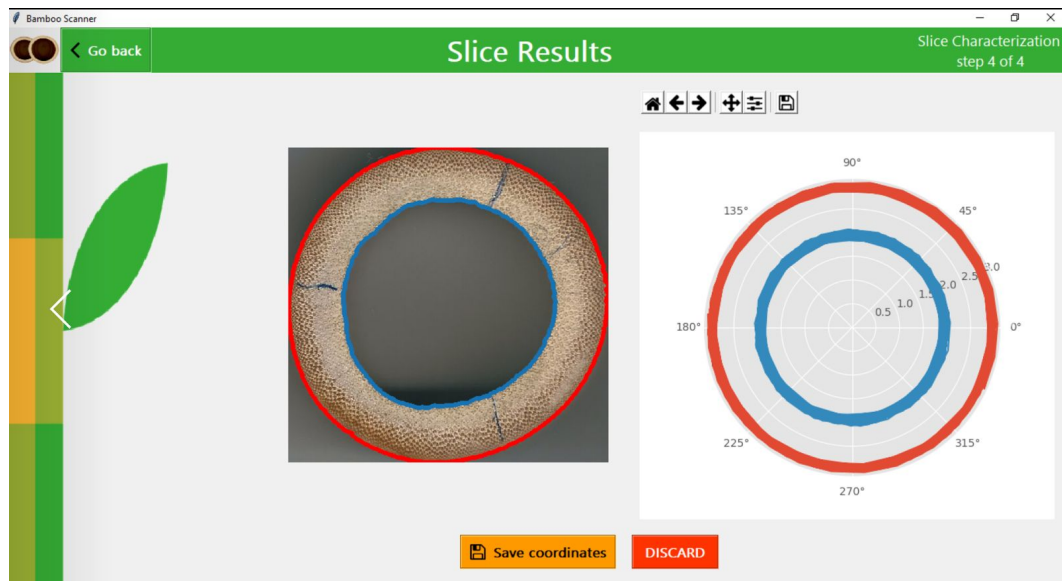




- A reference object has to be selected and its real measure (either width or height) must entered into the system. Select Use this object as reference and then select Confirm.



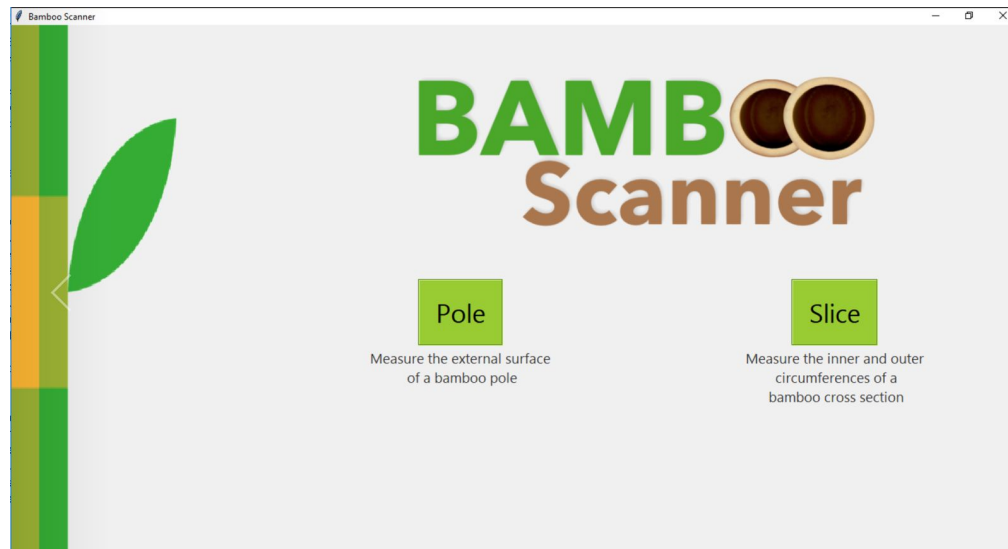
- Once the image is analyzed, a plot with the identified points along the circumferences will be shown.



- If satisfied with the result, select Save Coordinates. Otherwise, discard and the system will go back to the homescreen.
- After selecting Save Coordinates, select a destination folder and filename. After saving, the system will go back to the homescreen.

## Bamboo Pole Characterization:

- Connect USB cable from the BPC system into the computer and select BPC option from homescreen.



- Enter the diameter internal diameter of the structure where the infrared sensors are mounted on, the diameter of the calibration object for the IR sensors and the testing distance for the ultrasonic sensor. Enter sample information (Optional). Select Begin.

The screenshot shows the 'Configuration' screen, which is 'step 1 of 3' for 'Pole Characterization'. It has a green header with a 'Go back' button. The main area is titled 'Calibration Settings (all measures in centimeters)'. It contains three input fields: 'Ring structure diameter' with the value '23', 'Calibration object diameter' with the value '10', and 'Distance to the end of the rail' with the value '100'. Below this is a section for 'Information about the sample (optional)' with a text input field. A 'BEGIN >' button is in the bottom right corner.

- The system will show live readings from all sensors.

The screenshot shows the 'Live Sensor Readings (cm)' screen, which is 'step 2 of 3' for 'Pole Characterization'. It has a green header with a 'Go back' button. At the top, it says 'Ready!'. Below this is a table with 4 columns: 'Sensor #', 'Current reading', 'Last captured value', and 'Last deviation'. The table has 13 rows, numbered 1 to 12, and a final row for 'Sensor Z'. To the right of the table is a 'Calibrate Sensors' button. Below the table, it says '0 measurements captured' and there is a 'Capture Measurements' button. At the bottom right is a 'View Results >' button.

Sensor #	Current reading	Last captured value	Last deviation
1	9.69		
2	8.92		
3	8.79		
4	9.47		
5	9.05		
6	8.67		
7	9.61		
8	8.48		
9	8.31		
10	8.43		
11	8.67		
12	8.31		
Sensor Z	0.00		

- Three options are presented:

#### Calibrate Sensors:

- Optional but highly recommended at the beginning of the characterization of each sample sample. Place calibration object for the IR sensors centralized in reference to the ring structure. Select Calibrate Sensors.
- The system will calibrate the sensors and show the deviations for each sensors. If satisfied, select Continue. Otherwise, select Retry to run calibration again. NOTE: If calibration keeps yielding unusual deviation values, check wiring and reposition/replace sensor.

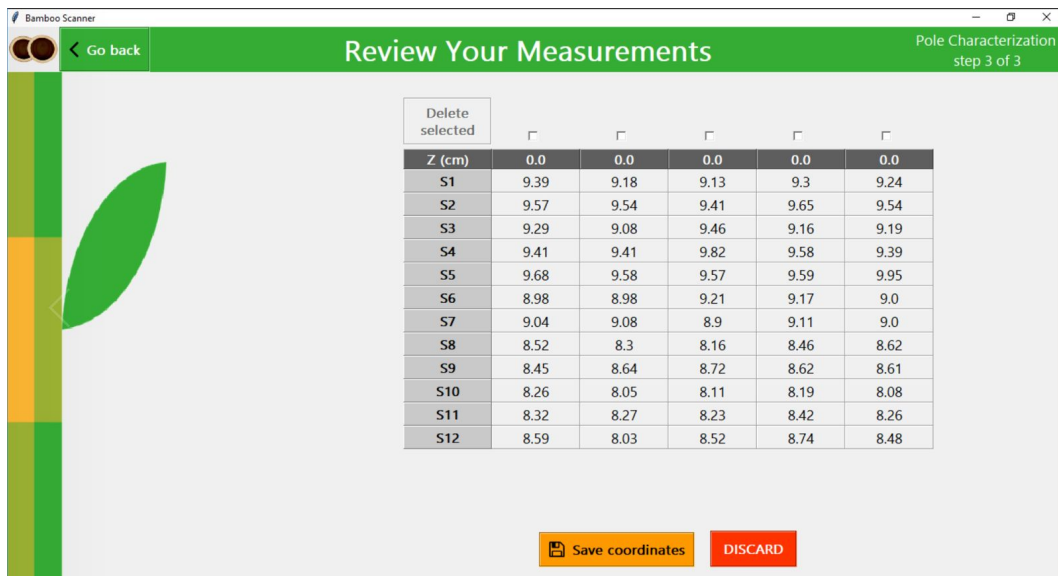
#### Capture Measurements:

- Select Capture. The system will capture a snapshot of the current sensors values.

#### View Results:

- Select Finish. The system will proceed into next screen.

- Once View Results is selected, the system will show the captured measurements. Unwanted measurements can be deleted.



Z (cm)	0.0	0.0	0.0	0.0	0.0
S1	9.39	9.18	9.13	9.3	9.24
S2	9.57	9.54	9.41	9.65	9.54
S3	9.29	9.08	9.46	9.16	9.19
S4	9.41	9.41	9.82	9.58	9.39
S5	9.68	9.58	9.57	9.59	9.95
S6	8.98	8.98	9.21	9.17	9.0
S7	9.04	9.08	8.9	9.11	9.0
S8	8.52	8.3	8.16	8.46	8.62
S9	8.45	8.64	8.72	8.62	8.61
S10	8.26	8.05	8.11	8.19	8.08
S11	8.32	8.27	8.23	8.42	8.26
S12	8.59	8.03	8.52	8.74	8.48

- If satisfied with the result, select Save. Otherwise, discard and the system will go back to the homescreen.
- After selecting Save, select a destination folder and filename. After saving, the system will go back to the homescreen.